09/09

Chem 1030 General Chemistry 1 (3-0-3)

Course maximum enrollment: 24

Special Facility or Equipment Needed: Lecture room with facilities for lecture/demonstration with multimedia available and preferably running water/sink; student desks suitable for note-taking

Lab fee: none

Course Description: Principles and problems of chemistry. This course is designed for students majoring in science and builds a foundation for other science or technology courses. This course introduces the fundamental laws, modern theories and principles of chemistry emphasizing atomic structure, periodicity, energy, bonding, and stoichiometry.

Pre- or Co-requisites: eligibility for Math 1010

Texts and Readings: General Chemistry: The Essential Concepts 5th edition or latest edition (ISBN: 13-978-007-3311-852) *Raymond Chang,* McGraw-Hill Companies.

Course Goals: This course emphasizes problem solving and conceptual understanding of basic principles of chemistry using examples which can be applied to everyday life.

Course Objectives:
The student should be able to:

- understand and discuss the basic principles of matter and energy using the basic vocabulary of chemistry.
- understand and apply appropriate units, measurements, and calculations to describe chemical changes, formulas, composition, concentrations.
- understand and explain the concept of the atom, the particles which make up the atom, isotopes, and be familiar with the technology used in studying the atom.
- understand and explain the chemical equation, balance a chemical equation, and interpret the moles of reactants and products in a reaction.
- understand and explain the periodic table as the classification of the elements, its significance and its usefulness.
- understand and explain the reactions of solutes in aqueous solutions, recognize nonelectrolytes, strong electroytes, and weak electrolytes, classify acids, bases, and salts.
- explain oxidation reduction reactions, reversible reactions, precipitation reactions, acid-base reactions.
- explain the different types of chemical bonds and to use the Lewis dot formula representation.
- explain the basic ides of the valence shell electron pair repulsion theory and to use the theory to predict electronic and molecular geometry of polyatomic molecules and ions.

- explain the relationships between molecular shapes and molecular polarities and predict whether a molecule is polar or nonpolar.
- understand and explain the basic ideas of molecular orbital theory.

Course Content/Outline:

- Science , theory, hypothesis, law
- Foundations of chemistry
- Energy, matter, states of matter, physical properties, physical changes, mixtures, compounds and elements, measurement, density, specific gravity, units of measurement, , metric system
- Chemical formulas and composition stoichiometry
- Atoms, molecules, ions, atomic weights, the mole, formula weights, percent composition, formula names
- Chemical equations and reaction stoichiometry
- Calculations, percent yield, concentrations, dilutions, titrations
- Some types of chemical reactions
- The periodic table, aqueous solutions, reactions in aqueous solutions, acid base reactions, oxidation numbers, oxidation-reduction reactions
- The structure of atoms
    - Fundamental particles, electrons, protons, atomic number, neutrons, mass number, mass spectrometry
- Chemical bonding
    - Ionic and covalent bonds, octet rule and limitations, resonance, Lewis formulas polar and nonpolar covalent bonds
- Molecular structure and covalent bonding theories, molecular orbitals in chemical bonding
- Acids, bases and salts
- Gases
- Review

Reading and Writing Across the Curriculum: The reading and writing components of these aforementioned assessments satisfies the Reading and Writing Across the Curriculum requirement as stipulated in SLCC's academic policy.

Grading/Absence Policies:

Three examinations are given. Final grade will be based on the cumulative points. The recommended scale is:

90% and above	A
80-89%	B
70-79%	C
60-69%	D
Below 60%	F

Students with Disabilities: Students with disabilities that may require assistance or accommodation or with questions related to any accommodations for testing, note takers, readers, etc. should contact the instructor as soon as possible. Students may also contact the Dean of Students with questions about such services.

Emergency Evacuation Procedure: A map of this floor is posted in the front of the building. This map marks the evacuation route and the Designated Rescue Area. This area is where emergency service personnel will go first to look for individuals who need assistance in exiting the building. Student who may need assistance should identify themselves to the teaching faculty.

Academic Dishonesty: A student will receive a grade of zero on an assignment or test for the following: cheating, plagiarism, or collusion. Any student who commits or attempts to commit any of these acts will be subject to disciplinary proceedings as detailed in the Student Discipline Procedures Outlined in the Student Handbook.